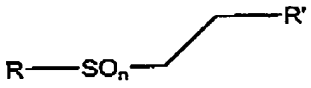
Application No.: 09/743,746
Attorney Docket No.: 068800-0276611

Amendments to the Claims

This listing of claims replaces all prior versions and listings of the claims in this application.

1. (Currently Amended) A method for identifying ~~characterizing~~ an analyte, comprising the steps of:

(a) providing a compound in which the analyte is attached by a cleavable linker to a reporter group relatable to the analyte, the compound having the following formula:



wherein either R comprises the reporter group and R' comprises the analyte, or R comprises the analyte and R' comprises the reporter group; wherein R' is selected from the group consisting of –S-, -SO-, -NR^1, and –O- between the C atom that is in the ß-position to the SO_n group and the reporter group or analyte, ~~wherein~~ R^1 is a hydrogen atom, a halogen atom, or a substituent containing a carbonyl group, a halogen atom, or both, and ~~; and wherein~~ n is 1 or 2; and wherein the analyte comprises a biological molecule comprising a nucleophile selected from the group consisting of amines, thiols, and hydroxyls;

(b) cleaving the reporter group from the analyte, wherein the cleavage takes place by beta-elinination between the R' group and the adjacent carbon atom; and

(c) identifying the reporter group by mass spectrometry and determining the mass-to-charge ratio of the reporter, thereby identifying ~~characterizing~~ the analyte.

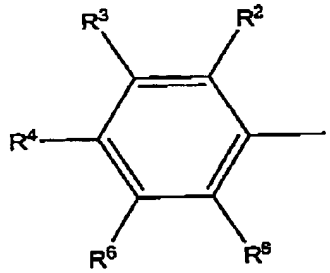
2. (Original) A method according to claim 1, wherein R and/or R' comprise a covalent linkage attaching the analyte and/or reporter group to the cleavable linker.

3. (Withdrawn) A method according to claim 2, wherein the covalent linkage is independently selected from a –CO-NH- group, an –NH-CO-NH- group, an –NH-CS-NH- group, a –CH_2-NH- group, a SO_2-NH- group, a –NH-CH_2-CH_2- group, or an –OP(=O)(O)O- group.

4. (Original) A method according to any preceding claim, wherein R comprises, between the SO_n group and the reporter group or analyte, a substituted or unsubstituted aromatic cyclic group, aliphatic cyclic group, or heterocyclic group.

5. (Previously presented) A method according to claim 4, wherein R comprises, between the SO_n group and the reporter group or analyte, a substituted or unsubstituted group selected from the group consisting of phenyl, pyridyl, pyranyl, napthyl, anthracyl, pyrenyl, and fused ring derivatives or heteroaromatic analogues of the above.

6. (Previously presented) A method according to claim 5, wherein the phenyl group is a group having the following formula:



wherein one of R^2-R^6 comprises the reporter group or analyte, and the remaining R^2-R^6 groups are independently selected from the group consisting hydrogen, deuterium, flourine, methyl, a methoxy group, a hydroxy group and an amino group.

7. (Cancelled)

8. (Previously presented) A method according to claim 1, wherein the R^1 group is an electron withdrawing group.

9. (Cancelled)

10. (Previously presented) A method according to claim 1, wherein R^1 is a fluorine atom, a chlorine atom, a bromine atom, an iodine atom, a trifluoroacetyl group, or a trifluoromethyl acetate group.

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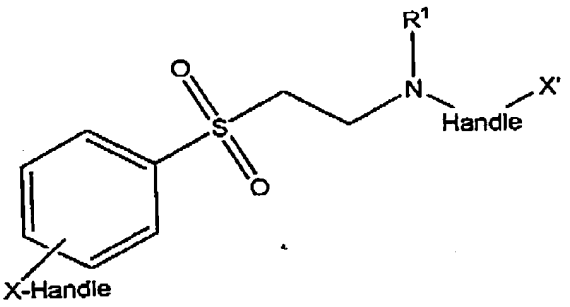
11. (Original) A method according to claim 1, wherein the compound has the following formula:



wherein R^1 is an electron withdrawing substituent, X comprises the reporter group and X' comprises the analyte, or X comprises the analyte and X' comprises the reporter group, and each Handle is the same or different, being either a single bond directly attaching the X groups to the phenyl ring and the N atom respectively, or a reactive group capable of attaching the X groups to the phenyl ring and the N atom respectively.

12. (Previously presented) A method according to claim 11, wherein R^1 is a hydrogen atom, a halogen atom, or a substituent comprising a carbonyl group and/or halogen atom.

13. (Previously presented) A method according to claim 11 or claim 12, wherein each Handle is independently selected from a –CO-NH- group, an –NH-CO-NH- group, an –NH-CS-NH- group, a $-CH_2$-NH- group, a SO_2-NH- group, a –NH-CH_2-CH_2- group, or an –OP(=O)(O)O- group.

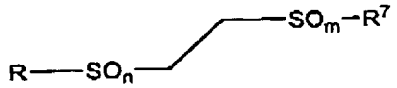
14. (Withdrawn) A method according to any preceding claim, wherein the analyte comprises a biological molecule.

15. (Withdrawn) A method according to claim 14, wherein the biological molecule is selected from a protein, a polypeptide, an amino acid, a nucleic acid, a nucleic acid base, a pharmaceutical agent or drug, a carbohydrate, a lipid, a natural product and a synthetic compound from an encoded chemical library.

16. (Withdrawn) A compound according to claim 15, wherein the nucleotide, oligonucleotide or nucleic acid is natural, or is modified by modifying a base, sugar and/or

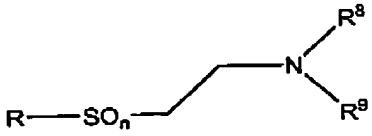
backbone of the nucleotide, oligonucleotide or nucleic acid.

17. (Withdrawn) A method according to claim 15 or claim 16, wherein the analyte is an amino acid or a peptide comprising a cysteine group, and the compound is of the formula:



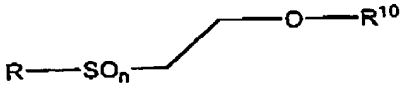
wherein m is 0 or 1 and the S atom attaching R^7 to the linker is the sulphur atom of the cysteine group, R^7 being the remainder of the amino acid or polypeptide.

18. (Withdrawn) A method according to claim 15 or claim 16, wherein the analyte is an amino acid or peptide, and the compound is of the formula:



wherein the N atom is the nitrogen atom of an epsilon amino group of a lysine group, or is the nitrogen atom of an N-terminal alpha amino group, R^8 is selected from H, O or an N-protective group, R^9 being the remainder of the amino acid or polypeptide.

19. (Withdrawn) A method according to claim 15 or 16, wherein the analyte is an amino acid or a peptide comprising a serine, threonine and/or tyrosine group, and the compound is of the formula:



wherein the O atom is the oxygen atom from a hydroxyl group of the serine, threonine or tyrosine group, R^{10} being the remainder of the amino acid or polypeptide.

20. (Previously presented) A method according to claim 1, wherein the reporter group comprises a mass marker detectable by mass spectrometry.

21. (Original) A method according to claim 20, wherein the mass marker comprises an oligoether or a polyether.

22. (Original) A method according to claim 21, wherein the oligoether or polyether is a substituted or unsubstituted oligo- or poly-arylether.

23. (Withdrawn) A method according to claim 21 or claim 22, wherein the oligoether or polyether comprises one or more fluorine atom or methyl group substituents, or one or more ^{2}H or ^{13}C isotopic substituents.

24. (Withdrawn) A method according to any of claims 20-23, wherein the mass marker comprises a metal ion-binding moiety.

25. (Withdrawn) A method according to claim 24, wherein the metal ion-binding moiety is a porphyrin, a crown ether, hexahistidine, or a multidentate ligand.

26. (Withdrawn) A method according to claim 25, wherein the metal ion-binding moiety is a bidentate ligand or is EDTA.

27. (Withdrawn) A method according to any of claims 24-26, wherein the metal ion-binding moiety is bound to a monovalent, divalent, or trivalent metal ion.

28. (Withdrawn) A method according to claim 27, wherein the metal ion is a transition metal ion, or a metal ion of group Ia, IIA or IIIA of the periodic table.

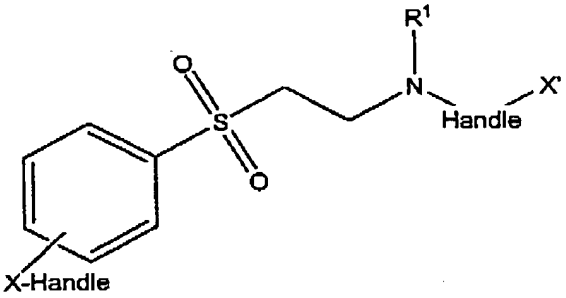
29. (Withdrawn) A method according to claim 28, wherein the metal ion is Ni^{2+}, Li^{+}, Na^{+}, K^{+}, Mg^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, or Al^{3+}.

30. (Withdrawn) A method according to any preceding claim, which method further comprises heating the linker to cleave off the reporter group.

31. (Previously presented) A method according to claim 1, wherein the reporter group is a mass marker and the method further comprises cleaving off the mass marker in the mass spectrometer.

32-34. (Cancelled).

35. (Withdrawn) A compound having the following formula:



wherein R^1 is an electron withdrawing substituent, X comprises the reporter group and X' comprises the analyte, or X comprises the analyte and X' comprises the reporter group, and each Handle is the same or different, being either single bond directly attaching the X groups to the phenyl ring and the N atom respectively, or a reactive group capable of attaching the X groups to the phenyl ring and the N atom respectively.

36. (Withdrawn) A compound according to claim 35, wherein R^1 is selected from a hydrogen atom, a halogen atom, or a substituent comprising a carbonyl group and/or halogen atom.

37. (Withdrawn) A compound according to claim 35 or claim 36, wherein each Handle is independently selected from a –CO-NH- group, an –NH-CO-NH- group, an –NH-CS-NH- group, a $–CH_2$-NH- group, a SO_2-NH- group, a –NH-CH_2-CH_2- group, or an –OP(=O)(O)O- group.

38. (Withdrawn) A compound according to any of claims 35-37, wherein the analyte is as defined in any of claims 14-19.

39. (Withdrawn) A compound according to any of claims 35-38, wherein the reporter is as defined in any of claims 20-29.